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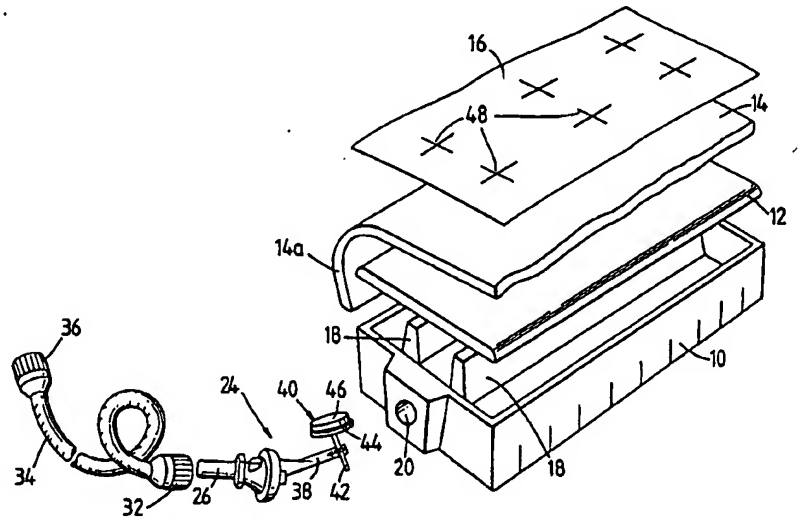

(57) Abstract

A self watering growing unit comprising a platform (12) for supporting plants or plant containers, a container (10) for holding a reservoir of water and provided with supports (18) for the platform, water absorbent capillary matting (14) supported by the platform and extending into the reservoir so that it soaks up water from the reservoir, a substantially impermeable top cover sheet (16) disposed on the absorbent matting through which apertures (48) are or may be formed to expose selected areas of the matting, and a float valve (24) connectible to a water supply and operable to control the supply of water to the container thereby to maintain a reservoir of water to a predetermined level in the container.

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SELF WATERING GROWING UNIT

The present invention relates to a self watering growing unit for plants (which term includes seedlings, plant cuttings and seeds).

Where it is desired to grow a large number of plants in individual pots or containers, whether domestically or commercially, keeping each pot supplied with water to keep the soil sufficiently moist can be time consuming and inconvenient.

In one existing arrangement pots are placed onto so-called capillary matting. The matting has good wicking properties so that when water is supplied to the matting it readily spreads throughout the matting. This water can then be absorbed by the soil or compost in plant pots, growing bags or the like placed in contact with the matting. The matting acts, to some extent, as a reservoir keeping pots supplied with water between waterings.

Other systems employed to supply water to plant pots include automated spraying and trickle feed systems. These are relatively complex and can be expensive.

It is an object of the present invention to provide an economical and reliable means for keeping plant pots or the like watered.

According to a first aspect of the invention there is provided a self watering growing unit for plants comprising a container for holding a reservoir of water, support means for plants or plant containers, means for conveying water from the reservoir to plants or plant containers supported by the support means, and automatic valve means connectible to a supply of water for controlling the supply of water to the container so as to maintain a reservoir in the container.

The support means preferably comprises a platform supporting a water absorbent matting constituting the means for conveying water from the reservoir to plants or plant containers supported by the platform, a part of the matting extending into the reservoir to enable the matting to soak up water from the reservoir.

Preferably the unit also has a substantially impermeable top cover disposed on the absorbent matting through which slits or apertures are or may be formed to expose selected areas of the matting. Thus, in use, plants or plant containers (including growing bags) may be placed on the top cover in contact with these areas so that they can absorb water from the matting.

The valve means is preferably a float valve comprising a float arranged so that, in use, it is in contact with the reservoir of water and a valve openable and closable by movement of the float caused by changes in the level of water in the reservoir to control the flow of water into the reservoir thereby to maintain a reservoir of water to a predetermined level in the container.

According to a second aspect of the present invention there is provided a self watering growing unit comprising a platform supporting a water absorbent matting, a container for holding a reservoir of water arranged so that, in use, a part of the absorbent matting extends into the reservoir to enable the matting to soak up water from the reservoir, and a substantially impermeable top cover disposed on the absorbent matting through which apertures are or may be formed to expose selected areas of the matting.

Preferably, the platform is disposed above the reservoir, this allows only a controlled amount of water to be absorbed by the matting and prevents flooding. The matting preferably comprises capillary matting which has good wicking properties. The matting could be bonded to or applied as a coating on the platform.

The platform preferably comprises a sheet of plastics material, for example a sheet of styrene foam.

The container may be moulded from a plastics material. The top of the container is preferably open. The sides of the container may include ribs.

The container preferably includes a means for supporting the platform. Said means may comprise a flange extending around the periphery of the container. Additionally, said means may comprise one or more moulded supports formed in the base of the container. An upstanding lip preferably surrounds the flange.

The growing unit is preferably adapted to be connected to another, similar growing unit so that, in use, water flows from the first unit into the second unit. This second unit does not have to have valve means, the idea being that the valve means of the first growing unit controls the flow or water from a single water supply to both units. Further units may similarly be connected to the first or second unit.

In one embodiment the platform is arranged to substantially close the container. This reduces undesirable loss of water from the reservoir through evaporation.

The top cover preferably comprises a plastics sheet. The top cover preferably covers substantially all the exposed surface of the matting, except of course, those selected areas it is desired to expose. The top cover may be marked with footprints of a number of standard sized plant pots or the like to assist the user in forming desired apertures in the cover. Alternatively predetermined apertures could be marked by perforations to allow easy removal of sections of the cover. In another alternative the top cover could be provided with apertures already formed therethrough.

The top cover reduces evaporation of water from the matting allowing only selected sections to be exposed onto which plant pots, or the like may be placed. This reduces undesirable evaporation of water from the matting and hence the frequency with which the container needs to be re-filled with water.

Provision of a cover also shades the matting from incident light which can encourage algae growth on the matting. This is undesirable. To minimise light penetration through the cover it is preferably coloured white on its upper surface, to reflect light, and black on its lower surface to absorb any light that penetrates the white surface.

In order that the invention may be more clearly understood embodiments thereof will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 shows an exploded perspective view of one form of growing unit according to the invention;

Figure 2 is an exploded perspective view showing the manner in which two growing units of the form shown in Figure 1 are connected together; and

Figure 3 is a perspective view, partly cut away, of another form of growing unit according to the invention.

The growing unit illustrated in Figure 1 comprises a container 10, and a platform 12, capillary matting 14 and a top cover 16 arranged to be supported on the container 10.

The container 10 takes the form of a shallow tray, vacuum formed from a plastics material, for example ABS or polystyrene. The container 10 is substantially rectangular. The top edges of the side walls of the container may be formed with an outwardly projecting flange and a upwardly projecting lip as

in the embodiment shown in Figure 3. The side walls of the container may include spaced vertical ribs to increase the rigidity of the container.

Provided inside the container are two upstanding formations 18 which comprise two substantially parallel, but spaced apart, elongate formations of substantially trapezoidal cross-section moulded into the base of the container.

The top surfaces of the formations 18 lie substantially in the same plane as the top edges of the side walls of the tray (or the top surface of the flange if provided) so that they together provide a support for the platform 12 (which is shaped and dimensioned to fit inside the upwardly projecting lip if provided).

Two circular apertures 20 and 22 are provided centrally in the shorter side walls of the container (Figure 2). A float valve assembly 24 is installed into aperture 20 to allow for automatic filling of the container 10 with water in such a way as to maintain a reservoir of water in the container.

The float valve assembly comprises a valve body 26 which extends through the aperture 20 and is secured in the aperture in a water-tight manner. The body 26 has a through-bore communicating at the outer end of the body with a water inlet and at the inner end of the body with a discharge outlet. The water inlet is connectible by a connector 32 to a hosepipe 34 which is in turn connectible by a further connector 36 to a constant supply of water, for example a rainwater butt or the mains water supply. The through-bore in the valve body 26 incorporates a valve which is arranged to be opened and closed by downwards and upwards movement, respectively, of a pivoted lever 38 carrying a float 40 thereby to control the flow of water from the supply through the discharge outlet into the container.

This float 40 which is disposed inside the container between the formations 18; is carried by a stem 42 attached to the outer end of the pivoted lever 38 so that it can be adjusted vertically relative to the lever, the float comprising a rigid plastics disc 44 connected to the stem and a plastics foam disc 46, for example of polyurethane, attached to the disc 44.

The float is arranged, by adjustment of the stem 42, to cause the flow of water into the container to be cut off by closing the valve when the water is at an appropriate level, and to open the valve to allow water to flow into the container when the water falls below that level. The water in the container is therefore maintained at a constant level.

The platform 12 is formed from a rigid polystyrene foam sheet.

The capillary matting 14 is formed from any known capillary matting or/and other suitable material having good wicking properties.

When in use the capillary matting 14 is supported on the platform 12 which is, in turn, supported on the container 10. Part 14a of the capillary matting is arranged to fold underneath the platform 12, passing between the edge of the platform 12 and the adjacent longer side wall of the container. Thus, it is desirable that there is sufficient clearance between the platform 12 and the said side wall to allow the capillary matting 14 to pass therebetween when the platform 12 is supported on the container 10. If the side walls of the tray are formed with ribs of outwardly curving form, these ribs assist in this respect since the internal vertical channels formed by the ribs ensure that at least some of the capillary matting 14 does not become so squashed as to impair its function.

The water in the container is wicked up by the capillary matting so that the surface of the capillary matting 14 supported by the platform 12 is kept moist.

The top cover 16 comprises a layer of polythene sheeting coloured white on one side and black on the other. The polythene sheet 16 is, in use, placed over the capillary matting 14. Cross cuts 48 are formed in the sheeting 16 to enable water from the matting to be absorbed by plant pots placed over the units. The polythene sheeting 16 serves to reduce evaporation of water from the surface of the capillary matting and hence reduces the amount of refilling necessary.

The polythene sheeting would normally be placed with its black side adjacent the capillary matting and its white side exposed. This helps to prevent incident light falling on the matting which is undesirable as it leads to the growth of algae on the matting. The white surface of the sheeting 16 acts to reflect light away from the surface. This can enhance the amount of light falling onto plants placed on the growing unit.

Figure 2 shows the growing unit of Figure 1 connected to another, similar unit in which like parts are designated by the same reference numerals with the addition of the numeral "1". In this case the aperture 22 in the first unit is connected by a connector 50 to a short length of hosepipe 52 which is in turn connected by a connector 54 to the aperture 201 in the container 101 of the second growing unit. The aperture 221 of this second unit is closed by a plug 56.

With this arrangement, therefore, water flows from the first unit into the second unit and the float valve of the first unit acts to control the level of water in both units.

If the first unit is used by itself, the plug 56 is fitted in its aperture 22.

Further units can be added to the two units shown in Figure 2 so that all the units are filled from a single supply under the control of the one float valve.

Referring to Figure 3 an alternative embodiment also comprises a container 58 arranged to support a platform 60 which in turn supports a capillary matting 62 and a top cover 64. These components are the same as the corresponding components of the embodiment shown in Figure 4 but in this case the top edges of the side walls of the container are shown formed with a flange 66 projecting laterally around its periphery. An upwardly projecting lip 68 is formed around the periphery of the flange 66.

The top surfaces of the formations 70 corresponding to the formations 18 lie substantially in the plane of the top surface of the peripheral flange 66 in order to support the platform 60 which is shaped and dimensioned to fit inside the lip 68. The matting 62 and the sheeting 64 likewise fit inside the lip.

Apertures 72 are formed in the sheeting 64 each corresponding to the base of a plant pot which may then be placed onto the capillary matting through the aperture. The plant pot can then absorb water from the matting while the polythene sheeting 64 serves to reduce evaporation of water from the surface of the capillary matting not covered by the plant pot.

Alternatively the cover sheet may be marked with the footprints of a number of standard sized plant pots to assist the user in forming the desired apertures, for example by cutting the sheet, or predetermined shapes could be marked by perforations to allow them to be easily removed.

Any one growing unit could be supplied with a number of different cover sheets to allow it to be used with different containers.

Growing units according to the present invention provide a convenient way of keeping a number of plant pots, growing bags, or the like moist but without flooding. The wicking action avoids overwetting of the pots and the provision of a reservoir allows the units to function for extended periods where there is no continuous supply of water. Provision of a top cover reduces loss of water through evaporation and the formation of algae on the capillary matting. This increases the useful life of the matting.

The above embodiments are described by way of example only, many variations are possible without departing from the invention.

CLAIMS

1. A self watering growing unit for plants comprising a container for holding a reservoir of water, support means for plants or plant containers, means for conveying water from the reservoir to plants or plant containers supported by the support means, and automatic valve means connectible to a supply of water for controlling the supply of water to the container so as to maintain a reservoir in the container.

2. A growing unit as claimed in Claim 1 in which the support means comprises a platform supporting a water absorbent matting constituting the means for conveying water from the reservoir to plants or plant containers supported by the platform, a part of the matting extending into the reservoir to enable the matting to soak up water from the reservoir.

3. A growing unit as claimed in Claim 2 which also has a substantially impermeable top cover disposed on the absorbent matting through which slits or apertures are or may be formed to expose selected areas of the matting.

4. A growing unit as claimed in Claim 1, 2, or 3 in which the valve means is a float valve comprising a float arranged so that, in use, it is in contact with the reservoir of water and a valve openable and closable by movement of the float caused by changes in the level of water in the reservoir to control the flow of water into the reservoir thereby to maintain the level of water in the container.

5. A self watering growing unit comprising a platform supporting a water absorbent matting, a container for holding a reservoir of water arranged so that, in use, a part of the absorbent matting extends into the reservoir to enable the matting to soak up water from the reservoir, and a substantially impermeable

top cover disposed on the absorbent matting through which apertures are or may be formed to expose selected areas of the matting.

6. A growing unit as claimed in Claim 2, 3 , 4 or 5 in which the support means or platform is disposed above the container and the container includes means for supporting the support means or platform.

7. A growing unit as claimed in Claim 6 in which the container is an open-topped container provided with a flange extending around its periphery for supporting the support means or platform.

8. A growing unit as claimed in Claim 7 in which an upstanding lip is provided around the periphery of the flange to locate and hold the support means or platform.

9. A growing unit as claimed in Claim 6, 7 or 8 in which the means for supporting the support means or platform comprises one or more supports provided in the base of the container.

10. A growing unit as claimed in any of the preceding claims which is adapted to be connected to another, similar growing unit so that, in use, water flows from the first unit into the second unit.

11. A growing unit as claimed in Claim 3, Claim 4 when dependent on Claim 3, or any one of Claims 5 to 10 in which the top cover comprises a plastics sheet marked with footprints of a number of standard sized plant pots or the like to assist the user in forming desired apertures in the cover, or provided with perforations to allow easy removal of sections of the cover, or provided with apertures already formed therethrough.

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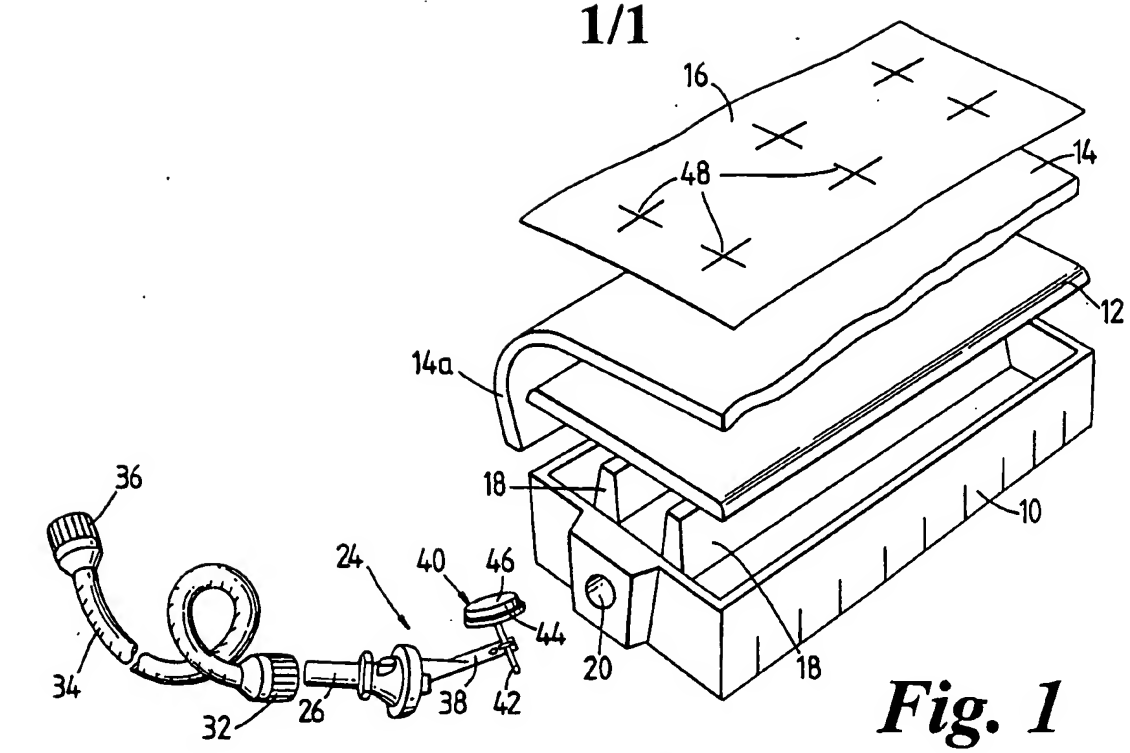

Fig. 1

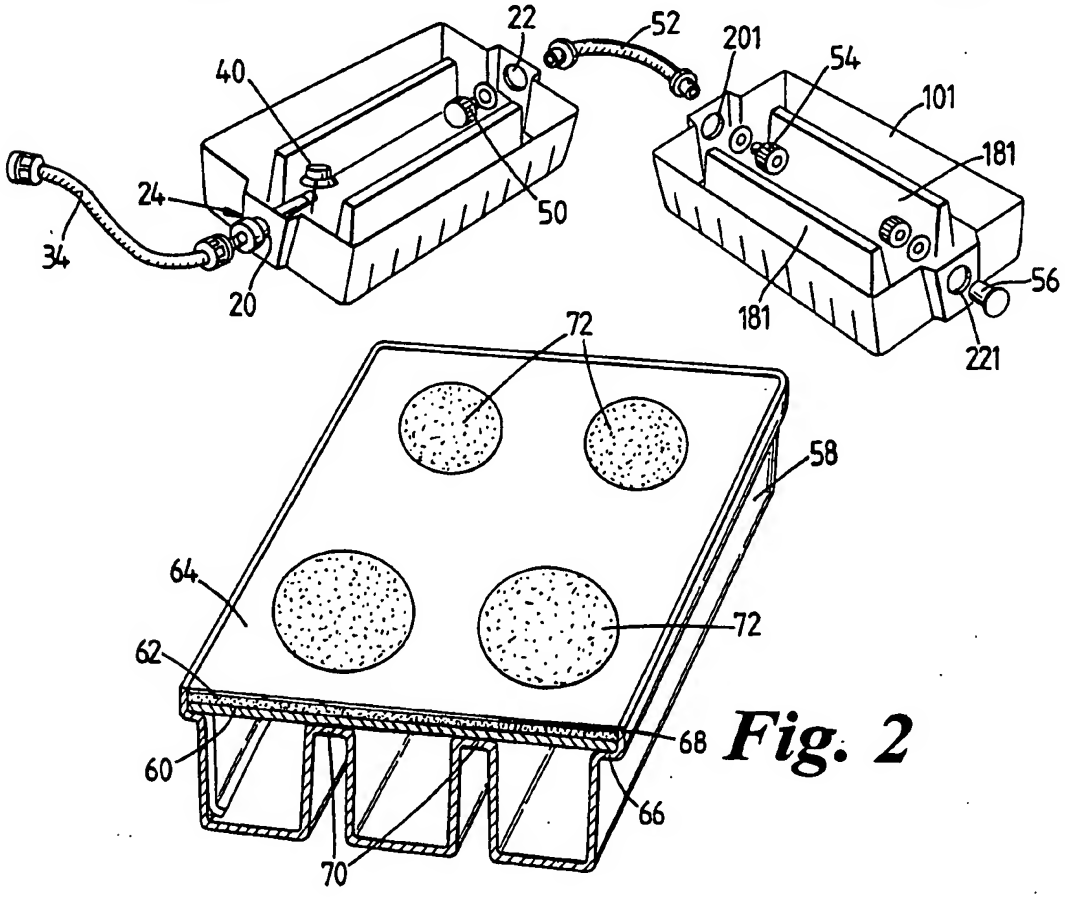

Fig. 2

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INTERNATIONAL SEARCH REPORT

Int. ..onal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A01G27/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 556 580 A (SPENCER T H N) 28 November 1979 (1979-11-28)	1-5,11
Y	page 1, line 31 - line 48 page 1, line 93 -page 2, line 87 figures 1-3	6-9
Y	GB 1 581 228 A (HARRISON G J) 10 December 1980 (1980-12-10)	6-9
A	the whole document	1,5

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
19 June 2000	27/06/2000

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